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U. S. DEPARTMENT OF COMMERCE

WEATHER BUREAU

KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.32

CATALOGUE OF METEOROLOGICAL SATELLITE DATA—TIROS II TELEVISION CLOUD PHOTOGRAPHY

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CATALOGUE OF METEOROLOGICAL SATELLITE DATA—TIROS II TELEVISION CLOUD PHOTOGRAPHY

WASHINGTON, D. C. : 1963

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PURPOSE

The Key to Meteorological Records Documentation Series has been established to provide guidance information to research personnel making use of climatological data.

Frequently users of such data have found it necessary to spend a great deal of time establishing whether the criteria for observing or computing various elements have changed over the period of record or in what form the data are available.

It is therefore hoped that the presentation of this series may not only conserve valuable time but may have a direct influence on improving the accuracy of research results.

PREFACE

This bulletin contains a complete listing of cloud photographs obtained by the TIROS II meteorological satellite, and describes how copies of these photographs may be obtained from the National Weather Records Center.

Robert L. Pyle
National Weather Satellite Center

CATALOGUE OF METEOROLOGICAL SATELLITE DATA--
TIROS II CLOUD PHOTOGRAPHY

TIROS II was launched by the National Aeronautics and Space Administration on November 23, 1960. The satellite traveled in a nearly circular orbit averaging 365 nautical miles above the earth's surface with a difference of about 60 nautical miles between perigee and apogee. The orbit was inclined at an angle of 48.5° to the earth's equatorial plane and this confines the picture coverage to the zone bounded by 55° north and south latitude. The satellite circled the earth a fraction more than 14 times each day with an orbital period of 98.25 minutes.

Meteorologically usable pictures were obtained until early August 1961, although coverage was sporadic after February 1. The cameras were exercised occasionally until December 1961. Pictures from the wide-angle camera were never of as high quality as were those from the other TIROS satellites. The narrow-angle pictures, though of excellent quality, are difficult to locate accurately on a map without good attitude fixes from concurrent wide-angle pictures of good quality.

The satellite was spinning at a rate that varied between 8 and 12 r.p.m. Being spin-stabilized, the spin axis orientation in space changed only gradually during its operational lifetime. Its two cameras were mounted with their optical axes parallel to the spin axis, so that the earth was within their fields of view during somewhat less than half of each orbital pass. Usable picture coverage was thus restricted to the portion of each orbital pass during which the underlying earth was both sunlit and within view of the cameras.

Camera 2, the wide-angle camera, had a 104° field of view and covered an area of about 800 miles square when its optical axis was normal to the earth's surface. At other times a larger area was included in oblique perspective. Camera 1, with a 13° field of view, provided a magnified view of a much smaller area.

Camera action aboard TIROS II was controlled from two Command-and-Data Acquisition (CDA) stations, one located at Pacific Missile Range, Point Mugu, California, and the other initially at Fort Monmouth, New Jersey. After April 29, the east coast CDA station was moved from Fort Monmouth to Wallops Station, near Chincoteague, Virginia. The satellite came within radio range of one or both CDA stations for a few minutes each on 8 or sometimes 9 of its 14 daily passes. During the time the satellite was within range of a station a series of television pictures could be received directly as they were taken, if it was daytime and the optical axes were appropriately oriented; a previously commanded tape sequence could be played back; and the system could be commanded to take pictures remote from the station after a specified time delay and store them on tape aboard the satellite.

Direct pictures obtained by one station on any one pass are grouped into one or two sequences depending on whether or not the series was interrupted to permit playback of a tape sequence. The time interval between frames was either 10 or 30 seconds for most direct sequences. Tape pictures were always taken at 30-second time intervals in sequences of up to 32 frames each.

The pictures are virtually square with some small distortion resulting from the particular setting of the electronic readout equipment. "Fiducial marks" etched on the face of the vidicon tube appear in the picture image as a central cross and four L-shaped corners, although they may show poorly or not at all against a dark background.

Since the satellite was spinning, the earth's image rotates from frame to frame by an amount that depends on how much the satellite's spin rate departed from being an integral number of rotations during the picture-taking interval. The rotation rate may be considered constant during any one sequence. The center of rotation (image primary point), which is the point where the spin axis intersects the image plane, is not quite at the central fiducial cross mark, but is displaced slightly as indicated in reference (1), figures 19 and 20.

Cloud picture transmissions received at CDA stations were displayed on a television screen and simultaneously recorded on magnetic tape. A 35 mm. camera photographed the television screen, including also a panel board mounted underneath. The panel board information provides a legend for each picture including camera number, mode (tape or direct), frame number, orbital pass number, and a clock. Pictures acquired at the Fort Monmouth or Wallops CDA stations are identified by the letter M at the lower right; those from the Pt. Mugu station bear the letter H at the lower left. The clock shown on the panel board usually gives the time that the archival film was produced.

IT IS IMPORTANT TO NOTE THAT THE TIME SHOWN ON THE CLOCK
DOES NOT INDICATE PICTURE-TAKING TIME.

Frame number is indicated by the sum of the series of numerals across the center of the legend. A similar series of numbers at the bottom of the legend was designed to give information on sun angle, but the system did not work properly and the values cannot be easily interpreted. Within each sequence, the indicated frame numbers increase in the order that the pictures were received at the CDA station. For direct mode this is the time order in which the pictures were taken, but tape sequences were played back to the station in reverse time order. Pictures of both modes are arranged on the film in order of increasing frame number; therefore it is important to note that this arrangement is correct time order for direct sequences, but is reverse time order for tapes. Malfunctioning occasionally caused the frame counting system to behave erratically resulting in repetition and discontinuity in the frame number series.

The orderly time sequence of pictures is sometimes interrupted by spurious noise frames or complicated by skipped frames. In such cases the erratic frame numbers are not a dependable indicator of real picture counts. However, the regular rotation of image orientation is often a helpful clue in determining the actual time interval between particular frames.

The following pages of tabulated listings give descriptive information about the pictures obtained by TIROS II. In the listings each picture is described by one line, and for each station the sequences are listed in the order in which they appear on the film reel. The column headings have the following meanings:

REEL: Number of the film reel which contains the sequence.

FILM LEGEND: This section gives the information actually appearing on the film in the panel board legend accompanying each picture. This information is used to identify the sequence on the film reel. Errors in the panel board legend have been corrected with manual entries on the film. Some errors in frame number have also been corrected in this manner.

PASS: Orbital pass number on which the pictures were read out, as indicated in the upper right corner of the legend.

M: Mode of transmission indicated in the legend.
D = Direct
T = Tape

C: Camera number indicated in the legend.
1 = Narrow angle camera
2 = Wide angle camera
12 = Both camera alternating

S: CDA station which received the sequence.
P = Point Mugu, Calif.
M = Fort Monmouth, N. J.
W = Wallops Station, Va.

PICTURE SEQUENCE DATA: This section documents the picture content. Sequences having no usable frames are sometimes on the film reel and are therefore included in the listings, but are not documented in this section.

STARTING TIME:

PASS: Orbital pass number on which the first picture of the sequence was taken. For direct sequences this pass number and the readout pass number given under FILM LEGEND are the same. For tape sequences, however, picture taking usually began on an earlier pass.

M: Actual mode of transmission, coded as in FILM LEGEND.

C: Actual camera used, coded as in FILM LEGEND.

DATE: Month and day when the first picture was taken.

TIME: Hour, minute, and second (GMT) when the first picture was taken. On the film reel, the first picture is found at the beinning of direct sequences but at the end of tape sequences because the latter are arranged on the film in reverse time order.

FRAME:

US: Number of usable frames in the sequence.

+: Number of frames in which the central fiducial cross mark appears on the earth, indicating that the earth's image occupies a substantial portion of the picture.

GEOGRAPHICAL AREA COVERED: Column headings refer to numbered areas outlined in the area map, page 19. Column entries indicate the areas included in the picture sequence.

L: Presence of a landmark is indicated by the following code:
0 = No ground image anywhere in the sequence.
1 = Ground image possible but not seen.
2 = Ground image noticed but not identified.
3 = Identified ground image.

VBS: Presence of a Vortex, Cloud Bands, or Cloud Streets in the sequence is indicated by the following code:
0 = None anywhere in the sequence.
1 = Ill defined.
2 = Easily recognized.
3 = Pronounced.

This catalogue does not include coverage maps because of the uncertainties in location of many TIROS II sequences, arising from the relatively poor quality of the wide-angle pictures. However, nephanalyses were constructed for many of the sequences during the program for operational use of the pictures. All TIROS II individual nephanalyses, along with daily maps depicting all nephanalyses for TIROS I and III, are available on a microfilm reel priced at $6.00, which may be obtained from the National Weather Records Center.

A description of the problems and uncertainties encountered in geographically locating TIROS pictures is contained in reference (2).

TIROS II master films for the period from launch through September 27, 1961, are on deposit at the:

National Weather Records Center
U. S. Weather Bureau
Federal Building
Asheville, North Carolina

Persons or institutions desiring copies may order them from the National Weather Records Center in the form of 35 mm. positive transparencies for projection, or 35 mm. duplication negatives from which opaque prints can be made. The pictures are stored chronologically on 100-foot reels. Orders must be placed for one or more reels, at a cost of $6.00 each, as it is not now possible to furnish copies of individual frames or to provide enlargements or other picture formats. Reel number should be given when ordering. These film copies will be furnished without sprocket holes unless a specific request to the contrary is made when placing the order. Sprocketed copies are furnished at a cost of $6.50 per reel, and are not suitable for movie projection.

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REFERENCES

1. Fujita, T.: "A Technique For Precise Analysis For Satellite Data; Volume I - Photogrammetry", Meteorological Satellite Laboratory Report No. 14, U. S. Department of Commerce, Weather Bureau, Washington, D. C., 1963.

2. Pyle, R.L.: "Documentation for TIROS IV Television Data", Meteorological Satellite Laboratory Report No. 16, U. S. Department of Commerce, Weather Bureau, Washington, D. C., 1963.

| REEL | FILM LEGEND | | | | PICTURE SEQUENCE DATA | | | |

REEL	FILM LEGEND				PICTURE SEQUENCE DATA					FRAME		GEOGRAPHICAL AREA COVERED																LVBS
	PASS	M	C	S	PASS	M	C	DATE	TIME	US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
203	0146	T	2	M	0145	T	2	1203	090015	32	30						6					11	12						3000
203	0147	T	2	M	0146	T	2	1203	103912	31	28					5	6												3000
203	0148	T	2	M	0147	T	2	1203	121600	32	31					5						11							0000
203	0149	T	1	M	0148	T	1	1203		16	24				4	5					10								0002
203	0149	T	2	M	0148	T	2	1203	135800	26	26				4	5					10								3000
252	0150	D	2	P	0150	D	2	1203	173457	05	06			3															1000
252	0150	T	2	P	0149	T	2	1203		29	29				4						10								1020
252	0150	D	1	P	0150	D	1	1203	173427	04	04			3															1000
203	0159	T	2	M	0151	T	2	1203	185500	07	00																		0000
203	0160	T	2	M	0159	T	2	1204	075717	31	29						6						12						3000
203	0161	T	2	M	0160	T	2	1204	093430	32	29						6					11							0000
203	0162	T	2	M	0161	T	2	1204	111233	32	28					5	6					11							3000
203	0163	T	2	M	0162	T	2	1204	125049	32	31				4	5					10								0000
203	0163	D	2	M	0163	D	2	1204	132800	12	07				4						10								0000
252	0164	T	2	P	0163	T	2	1204		28	28				4						10								1000
252	0165	D	2	P	0165	D	2	1204	174517	16	12			3						9									0000
203	0173	T	2	M	0167	T	2	1204	210200	32	28		2							9									0003
204	0174	T	2	M	0173	T	2	1205	065520	32	32						6	7					12						3000
204	0175	T	2	M	0174	T	2	1205	082957	32	29						6					11	12						3000
204	0176	T	2	M	0175	T	2	1205	100830	32	30						6					11							3000
204	0177	T	2	M	0176	T	2	1205	114630	32	29					5						11							0000
252	0178	T	2	P	0177	T	2			28	25				4	5													2000
204	0187	T	2	M	0181	T	2	1205	200531	10	10		2							9									0000
204	0191	T	2	M	0190	T	2	1206		03	00																		0003
204	0192	T	2	M	0191	T	2	1206	121217	17	13					5					10								0000
204	0192	D	2	M	0192	D	2	1206	135800	12	05				4														0010
252	0193	T	2	P	0192	T	2	1206	140246	16	16				4						10								2000
252	0193	D	2	P	0193	D	2	1206	153358	00	00			3															0300
204	0202	T	2	M	0194	T	2	1206	203000	30	22		2							9									0010
204	0204	T	2	M	0203	T	2	1207	080120	31	28											11	12					17	3000
204	0205	T	2	M	0204	T	2	1207	093900	32	28						6					11							2000
204	0206	T	2	M	0205	T	2	1207	111652	31	31					5					10	11							0021
204	0207	T	2	M	0206	T	2	1207	125507	31	29				4						10								0000
252	0208	T	2	P	0207	T	2	1207	143330	22	22			3						9	10								1000
252	0209	T	2	P	0208	T	2	1207	161200	30	29			3						9	10								2010
204	0216	T	2	M	0211	T	2	1207	210400	30	22		2						8	9									0003
204	0217	T	2	M	0216	T	2	1208	054036	29	23													13					0000
204	0218	T	2	M	0217	T	2	1208	072029	24	19													13					0000
204	0219	T	2	M	0218	T	2	1208	084555	32	32											11						17	3020
252	0220	T	2	P	0219	T	2	1208		00	12											11							0000
252	0221	T	2	P	0220	T	2	1208	115126	29	29					5					10	11					16		1000
252	0222	T	2	P	0221	T	2	1208	134754	32	32										10								1020
252	0223	T	2	P	0222	T	2	1208	150742	32	26										10								1020
204	0231	T	2	M	0230	T	2	1209	043300	30	29													13					0020
204	0232	T	2	M	0231	T	2	1209	054612	32	19						6					11	12						3000
205	0233	T	2	M	0232	T	2	1209	075230	31	20													13				17	0003
205	0234	T	2	M	0233	T	2	1209	091000	31	28											11							1010
253	0235	T	2	P	0234	T	2	1209	104802	32	27										10	11					16		0000
253	0236	T	2	P	0235	T	2	1209	122547	32	27										10								1000
253	0237	T	2	P	0236	T	2	1209	140329	32	26				4						10					15			1003
205	0245	T	2	M	0237	T	2	1209	155118	31	31										10					15			3000
205	0246	T	2	M	0245	T	2	1210	050803	32	29																16	17	0000
205	0247	T	2	M	0246	T	2	1210	064630	31	27																16	17	0020
205	0248	T	2	M	0247	T	2	1210	081730	32	32											11						17	0130
253	0249	T	2	P	0248	T	2	1210	094843	21	24											11							0000
253	0250	T	2	P	0249	T	2	1210		12	17																		0000
253	0251	T	2	P	0250	T	2	1210		08	11																		0000
253	0252	T	2	P	0251	T	2	1210	144144	13	16										10					15			0030
205	0252	T	2	M	0253	T	2	1209	175530	32	24									9					14				0003
205	0261	T	2	M	0260	T	2	1211	054400	28	29													13					0000
205	0262	T	2	M	0261	T	2	1211	072230	28	26													13				17	0003
205	0263	T	2	M	0262	T	2	1211	084506	31	32											11						17	3000
253	0264	T	2	P	0263	T	2	1211	102300	32	32										10	11					16		0300
253	0265	T	2	P	0264	T	2	1211	120023	32	32										10					15			0010
253	0266	T	2	P	0265	T	2	1211	133903	31	31										10					15			0000
205	0274	T	2	M	0266	T	2	1211	152300	31	31									9	10					15	16		0000
205	0275	T	2	M	0274	T	2	1212	043900	30	28													13	14				0000
205	0276	T	2	M	0275	T	2	1212	061659	15	15													13				17	0000
253	0279	T	2	P	0278	T	2	1212	105730	31	31										10						16		0000
253	0280	T	2	P	0279	T	2	1212	122900	32	22										10						16		0020
253	0281	T	2	P	0280	T	2	1212	140032	32	32										10					15			0003
205	0288	T	2	M	0282	T	2	1212	173700	28	28									9				13		15			0000
205	0289	T	2	M	0288	T	2	1213	033003	29	29													13				17	0000
205	0290	T	2	M	0289	T	2	1213	051059	32	32													13	14				
205	0291	T	2	M	0290	T	2	1213	063703	32	30											11						17	0000
205	0293	T	2	M	0291	T	2	1213	080900	32	20											11					16	17	3000
253	0294	T	2	P	0293	T	2	1213	113100	32	31										10						16		0000
253	0295	T	2	P	0294	T	2	1213	130900	32	31										10					15	16		2130
205	0303	T	2	M	0297	T	2	1213	181600	32	32														14	15	16		1200
206	0304	T	2	M	0303	T	2	1214	040530	32	32													13	14			17	0000
206	0305	T	2	M	0304	T	2	1214	054610	31	31													13				17	0003

| REEL | FILM LEGEND | | | | PICTURE SEQUENCE DATA | | | |

| REEL | FILM LEGEND | | | | PICTURE SEQUENCE DATA | | | |

REEL	FILM LEGEND				PICTURE SEQUENCE DATA					FRAME		GEOGRAPHICAL AREA COVERED																LVBS
	PASS	M	C	S	PASS	M	C	DATE	TIME	US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
210	0609	T	2	M	0608	T	2	0103	233235	28	26													13	14				0000
258	0610	T	2	P	0609	T	2	0104	011029	32	30								8					13					1020
258	0611	T	2	P	0610	T	2	0104	024902	32	30								8					13				17	3030
258	0612	T	2	P	0611	T	2	0104	042705	31	29								8					13				17	1130
258	0613	T	2	P	0612	T	2	0104	060513	32	25								8				12					17	0000
210	0621	T	2	M	0615	T	2	0104	110200	21	21																16		0000
210	0622	T	2	M	0621	T	2	0104	205800	28	28									9				13	14				0000
210	0623	T	2	M	0622	T	2	0104	222900	31	30									9				13	14				0000
210	0624	T	2	M	0623	T	2	0104	000700	32	31								8					13					0000
258	0625	T	2	P	0624	T	2	0105	014538	32	25								8					13				17	1000
258	0626	T	2	P	0625	T	2	0105	032337	32	31								8					13				17	1000
258	0627	T	2	P	0626	T	2	0105	050209	32	31													13				17	0000
210	0635	T	2	M	0629	T	2	0105	095555	32	32											11					16		3000
210	0636	T	2	M	0635	T	2	0105	195430	32	32									9					14				0000
210	0637	T	2	M	0636	T	2	0105	213800	31	31			3						9									0000
211	0638	T	2	M	0637	T	2	0105	230600	32	32									9				13	14				0000
258	0641	T	2	P	0640	T	2	0106	040635	31	31	1							8										1000
258	0642	T	2	P	0641	T	2	0106		31	31	1							8										3000
211	0649	T	2	M	0644	T	2	0106	104100	32	32						6	7				11							3300
211	0650	T	2	M	0649	T	2	0106	185400	31	31			3	4														1010
211	0651	T	2	M	0650	T	2	0106	203240	32	32			3						9									3000
211	0652	T	2	M	0651	T	2	0106	221818	32	32			3						9									0000
259	0653	T	2	P	0652	T	2	0107	234500	24	32								8	9				13					0000
259	0654	T	2	P	0653	T	2	0107	012159	32	32								8					13					1000
259	0655	T	2	P	0654	T	2	0107	025511	32	32								8					13					1000
259	0656	T	2	P	0655	T	2	0107	043338	32	32								8				12					17	1000
211	0664	T	2	M	0658	T	2	0107	093700	32	32						6	7				11	12						3000
211	0665	T	2	M	0664	T	2	0107	192700	32	32			3	4					9									0000
211	0666	T	2	M	0665	T	2	0107	205900	31	31									9				13	14				0000
211	0668	T	2	M	0667	T	2	0108	001200	30	30								8					13					0000
259	0669	T	2	P	0668	T	2	0108	015032	32	32								8					13					3000
259	0670	T	2	P	0669	T	2	0108	032841	32	32								8									17	0000
259	0671	T	2	P	0670	T	2	0108	050702	32	32												12					17	0000
211	0678	T	2	M	0671	T	2	0108	065230	30	30							7					12						2000
211	0679	D	2	M	0679	D	2	0108	183300	11	11				4														1000
211	0679	T	2	M	0678	T	2	0108	181530	32	32									9					14				0000
211	0680	T	2	M	0679	T	2	0108	195615	32	32		2	3															3000
211	0681	T	2	M	0680	T	2	0108	213000	32	32													13	14				0000
259	0682	T	2	P	0681	T	2	0108	230805	25	32								8					13					0000
259	0683	T	2	P	0682	T	2	0109	004629	32	32								8					13					3000
259	0684	T	2	P	0683	T	2	0109	022435	32	32								8					13				17	0000
259	0685	T	2	P	0684	T	2	0109	040911	32	32	1							8				12						0000
211	0693	D	2	M	0693	D	2	0109	172650	21	21				4	5													0000
211	0693	T	2	M	0688	T	2	0109	060030	32	32							7				11	12						3000
211	0693	D	2	M	0693	D	2	0109	173400	10	10				4	5													0000
211	0694	D	2	M	0694	D	2	0109	191020	12	12				4														0000
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REEL	FILM LEGEND				PICTURE SEQUENCE DATA																												
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REEL	FILM LEGEND				PICTURE SEQUENCE DATA																													LVBS
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| REEL | FILM LEGEND | | | | PICTURE SEQUENCE DATA | | | |

| REEL | FILM LEGEND | | | | PICTURE SEQUENCE DATA | | | |

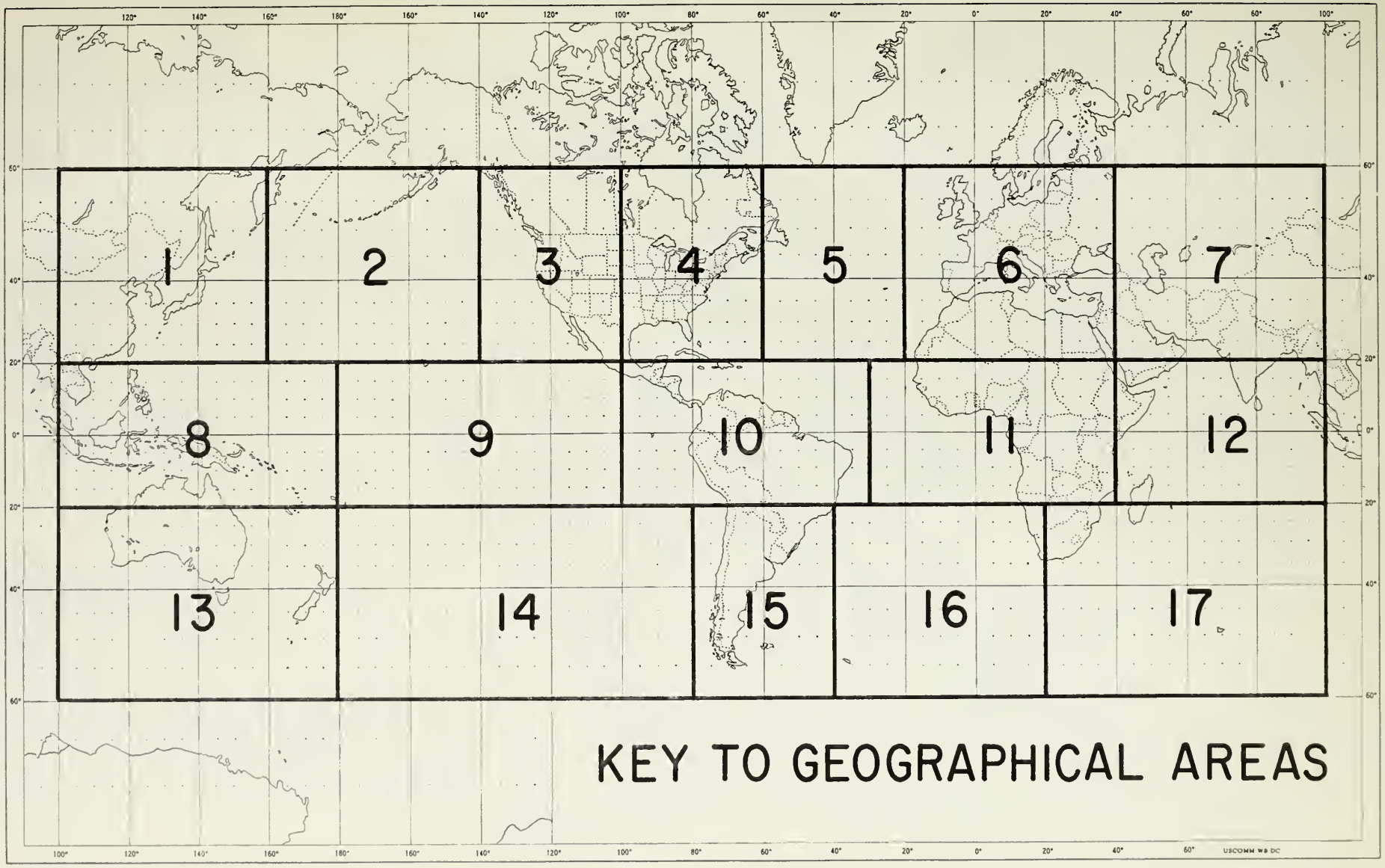
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221	1750	D	12	M	1750	D	12	0322	192940	07 07				4	5												3000
221	1751	T	1	M	1751	T	1	0322	205041	32 32		2	3						9								0000
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221	1761	D	2	M	1761	D	2	0323	131348	06 06				4													0000
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221	1776	D	2	M	1776	D	2	0324	134720	12 12				4													0030
221	1776	T	1	M	1769	T	1	0324	021830	22 22	1											12					0000
221	1777	D	1	M	1777	D	1	0324	153200	46 46				4	5												3000
221	1778	D	1	M	1778	D	1	0324	171550	40 40				4	5												3000
221	1779	T	1	M	1779	T	1	0324	184230	29 29			3	4													1020
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222	1794	T	1	M	1794	T	1	0325	191500	32 32			3	4													2000
222	1795	D	12	M	1795	D	12	0325	211551	06 06				4													0000
222	1795	T	1	M	1795	T	1	0325	205830	32 32		2	3														0000
222	1805	D	2	M	1805	D	2	0326	131520	11 08				4													1000
222	1805	T	1	M	1797	T	1	0326	001000	32 32	1	2															1000
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222	1807	D	2	M	1807	D	2	0326	164150	05 05				4													0000
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222	1819	D	2	M	1819	D	2	0327	120850	09 03				4													0000
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222	1822	D	1	M	1822	D	1	0327	172000	46 46				4	5												3000
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223	1835	D	2	M	1835	D	2	0328	142648	03 03				4													0000
223	1835	D	1	M	1835	D	1	0328	143058	34 34				4	5												1000
223	1836	D	2	M	1836	D	2	0328	161200	15 15				4	5												3000
223	1837	D	2	M	1837	D	2	0328	175500	16 16				4	5												3103
223	1838	D	2	M	1838	D	2	0328	193720	08 08				4													0000
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223	1848	D	2	M	1848	D	2	0329	113730	07 03				4	5												0000
223	1849	D	1	M	1849	D	1	0329	132100	46 40				4													1000
223	1850	D	2	M	1850	D	2	0329	150220	00 00				4	5												0000
223	1850	D	1	M	1850	D	1	0329	150630	31 31				4													3000
223	1851	D	2	M	1851	D	2	0329	164700	11 11				4													3000
223	1852	D	2	M	1852	D	2	0329	182849	07 07				4													3000
269	1853	D	2	P	1853	D	2	0329	200653	06 06			3														0000
269	1854	D	1	P	1854	D	1	0329	214944	01 01			3														3000
269	1854	D	2	P	1854	D	2	0329	215058	05 09			3														1000
269	1855	T	1	P	1854	T	1	0329	215014	28 31			3							10							3000
269	1855	D	2	P	1855	D	2	0329	233230	13 13			3							10							0000
223	1863	D	2	M	1863	D	2	0330	121050	03 00				4	5												0000
223	1864	D	1	M	1864	D	1	0330	135700	43 42				4	5												1000
223	1865	D	2	M	1865	D	2	0330		00 00																	0000
223	1865	D	1	M	1865	D	1	0330	154200	34 34				4	5												2000
223	1866	D	2	M	1866	D	2	0330	172150	01 01				4													0000
269	1867	D	2	P	1867	D	2	0330	185858	13 13			3														0000
269	1868	T	1	P	1867	T	1	0330	190320	32 32				4						10							0000
269	1868	D	2	P	1868	D	2	0330	204527	04 04			3														0000

REEL	FILM LEGEND			PICTURE SEQUENCE DATA																											
										FRAME		GEOGRAPHICAL AREA COVERED																			LVBS
	PASS	M	C	S	PASS	M	C	DATE	TIME	US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
269	1869	T	1	P	1868	T	1	0330	210005	32	32										10									0000
269	1869	D	2	P	1869	D	2	0330	222459	08	08			3						9										0000
223	1877	T	1	M	1871	T	1	0331	012200	01	01	1						7												0000
223	1878	D	2	M	1878	D	2	0331		00	00																			0000
223	1878	D	1	M	1878	D	1	0331	125200	28	27				4	5														0000
223	1879	D	2	M	1879	D	2	0331	143050	00	00																			0000
223	1879	D	1	M	1879	D	1	0331	143400	37	37				4	5														3003
223	1880	D	12	M	1880	D	12	0331	161422	07	07				4															3000
223	1881	D	12	M	1881	D	12	0331	175652	10	10				4															0000
269	1884	D	1	P	1884	D	1	0331	225918	18	18			3																0000
223	1891	T	1	M	1887	T	1	0401	033630	25	25																			0000
223	1892	D	2	M	1892	D	2	0401	113922	03	01																			0000
224	1893	D	12	M	1893	D	12	0401	132500	07	06				4	5														3000
224	1894	D	2	M	1894	D	2	0401	150800	10	10				4	5														2000
224	1895	D	2	M	1895	D	2	0401	165020	23	23				4															0000
269	1896	D	1	P	1896	D	1	0401	182651	20	20			3																0000
269	1897	D	2	P	1897	D	2	0401	201427	07	07			3																0000
269	1898	D	1	P	1898	D	1	0401	215258	10	10			3																0000
269	1898	T	2	P	1897	T	2	0401	201505	29	29			3	4						10									0000
224	1907	D	1	M	1907	D	1	0402	121650	32	24				4															0000
224	1908	T	1	M	1907	T	1	0402	122445	15	15				4	5														0000
224	1908	D	1	M	1908	D	1	0402	140440	42	42				4															3000
224	1909	D	1	M	1909	D	1	0402	154220	24	24				4															3000
224	1909	T	1	M	1908	T	1	0402	141002	14	14					5														0000
224	1909	D	2	M	1909	D	2	0402	154829	06	06				4															0000
224	1910	D	2	M	1910	D	2	0402	172449	00	00				4															0000
224	1910	T	2	M	1906	T	2	0402	103512	17	13				4	5														0220
269	1911	D	1	P	1911	D	1	0402	190050	25	26			3																0002
269	1912	T	1	P	1911	T	1	0402		30	30				4															2002
269	1912	D	1	P	1912	D	1	0402	204700	35	35			3																3000
224	1922	D	1	M	1922	D	1	0403	125049	00	00				4															0000
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224	1923	D	2	M	1923	D	2	0403	143700	16	16				4															0000
269	1926	D	2	P	1926	D	2	0403	194257	03	03			3																0000
269	1927	D	1	P	1927	D	1	0403	211844	25	25			3																0023
224	1937	T	1	M	1936	T	1	0404	120800	32	32						6					11								0000
224	1937	D	1	M	1937	D	1	0404	133310	18	18				4	5														0010
224	1938	T	1	M	1937	T	1	0404	134600	31	31						6					11								3000
224	1938	D	1	M	1938	D	1	0404	151330	35	35				4															1000
224	1939	D	1	M	1939	D	1	0404	165250	31	31				4															3003
270	1940	D	1	P	1940	D	1	0404	182959	17	45			3																2003
270	1941	D	12	P	1940	D	12	0404	201148	01	09			3																0003
224	1951	T	1	M	1950	T	1	0405	111026	23	23												12							0000
224	1951	D	1	M	1951	D	1	0405	122429	18	13				4															2000
225	1952	D	1	M	1952	D	1	0405	140249	28	21				4															2000
225	1952	T	1	M	1951	T	1	0405	124747	25	25											11	12							0000
225	1953	D	1	M	1953	D	1	0405	154519	29	29				4															3003
225	1965	T	1	M	1964	T	1	0406	093100	08	06				4	5														0000
225	1965	D	1	M	1965	D	1	0406	111828	06	00				4															0000
225	1966	T	1	M	1965	T	1	0406	114514	24	23											11	12						17	1000
225	1966	D	1	M	1966	D	1	0406	125930	30	25				4															0000
225	1967	D	1	M	1967	D	1	0406	143820	33	33				4															1003
225	1967	T	1	M	1966	T	1	0406	132330	24	23											11	12						17	0000
270	1968	D	1	P	1968	D	1	0406	161509	30	23			3																0000
270	1969	D	1	P	1969	D	1	0406	175658	18	36			3																3020
270	1970	D	12	P	1970	D	12	0406	193959	05	30			3																0000
225	1978	T	2	M		T	2			19	19																			0000
225	1982	D	1	M	1982	D	1	0407	153020	34	34				4															1000
225	1982	T	2	M	1981	T	2	0407	133600	29	29				4	5														3030
270	1983	D	1	P	1983	D	1	0407	165058	31	41			3																0000
270	1984	D	1	P	1984	D	1	0407	183539	50	50			3																3000
270	1985	D	2	P	1985	D	2	0407		00	00			3																0000
225	1994	T	1	M	1993	T	1	0408	091320	29	29					5	6													2000
225	1995	D	1	M	1995	D	1	0408	122550	20	13					5														0000
225	1996	D	1	M	1996	D	1	0408	140550	24	17					5														3003
270	1997	D	1	P	1997	D	1	0408	154251	22	13			3																0000
270	1998	D	1	P	1998	D	1	0408	172450	35	32			3																3000
225	2008	T	1	M	2007	T	1	0409		19	19																			0000
225	2009	T	1	M	2008	T	1	0409	094500	29	27						6													3003
225	2010	D	1	M	2010	D	1	0409	130120	32	24				4	5														2000
225	2011	D	1	M	2011	D	1	0409	144120	34	29				4	5														0000
270	2012	D	1	P	2012	D	1	0409	161910	36	31			3																0000
270	2013	D	1	P	2013	D	1	0409	180020	19	19			3																3000
270	2014	D	2	P	2014	D	2	0409	194400	04	04			3																0110
226	2023	T	1	M	2022	T	1	0410	084056	30	27						6													0000
226	2024	T	1	M	2023	T	1	0410	101859	29	26					5	6													0000
226	2025	D	1	M	2025	D	1	0410	133450	13	09				4															0003
270	2026	D	1	P	2026	D	1	0410	151200	10	08			3																0000
270	2027	D	2	P	2027	D	2	0410	165450	20	29			3																0003

REEL	FILM LEGEND				PICTURE SEQUENCE DATA					FRAME		GEOGRAPHICAL AREA COVERED															LVBS
	PASS	M	C	S	PASS	M	C	DATE	TIME	US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
226	2039	D	1	M	2039	D	1	0411	123055	23	15				4														0000
226	2040	D	2	M	2040	D	2	0411	140950	07	06				4														0000
271	2041	D	2	P	2041	D	2	0411		00	00			3															0000
271	2042	D	1	P	2042	D	1	0411	172750	35	35			3															0000
226	2054	D	1	M	2054	D	1			00	00																		0000
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226	2064	T	1	M	2057	T	1	0413	180400	26	26																		0000
226	2064	D	1	M	2064	D	1	0413	050758	00	00																		0000
271	2068	T	1	P	2067	T	1	0413	102954	32	29											11							2000
271	2071	T	1	P	2070	T	1	0413	162435	29	27										10								0000
271	2100	T	1	P	2099	T	1	0414	145701	21	21										10								0000
271	2129	T	1	P	2128	T	1	0417	142442	32	28										10								0000
271	2129	D	2	P	2129	D	2	0417	155840	00	00			3															0000
271	2142	T	1	P	2139	T	1	0418	082600	29	25											11							0000
271	2143	T	1	P	2142	T	1	0418	131902	28	25										10								0000
271	2144	T	1	P	2143	T	1	0418	145907	31	25										10								3000
226	2154	T	1	M	2152	T	1	0419	054200	27	24											11							1000
226	2155	T	1	M	2154	T	1	0419	090031	29	26										10								2000
226	2168	T	1	M	2167	T	1	0420	061725	29	26											11						17	1000
226	2170	T	1	M	2168	T	1	0420	075500	29	26												12					17	2000
271	2172	T	1	P	2171	T	1	0420	125015	32	25										10						16		0000
226	2183	T	2	M	2182	T	2	0421	052030	29	29																		0000
226	2184	T	2	M	2183	T	2	0421	083802	32	32											11					16	17	3000
226	2185	T	2	M	2184	T	2	0421	101606	32	32											11					16	17	1030
226	2194	T	1	M		T	1			26	23																		0000
226	2195	T	2	M		T	2			16	02																		0000
226	2197	T	2	M	2195	T	2	0422	041750	31	31													13				17	0030
226	2199	T	2	M	2197	T	2	0422	073230	32	32																16	17	1030
227	2211	T	2	M	2209	T	2	0423	031037	32	32													13				17	0030
227	2213	T	2	M	2211	T	2	0423	062440	32	32											11					16	17	0030
227	2214	T	2	M	2213	T	2	0423	094338	32	32												12	13				17	0030
227	2224	T	2	M	2223	T	2	0424	020501	32	31													13				17	0030
227	2226	T	2	M	2224	T	2	0424	034346	32	31													13				17	0030
227	2228	T	2	M	2226	T	2	0424	065952	32	32																	17	1030
227	2239	T	2	M	2238	T	2	0425	023808	32	32													13				17	0130
227	2241	T	2	M	2239	T	2	0425	041702	32	31													13				17	0010
227	2243	T	2	M	2241	T	2	0425	073236	32	32																16	17	0010
227	2253	T	2	M	2252	T	2	0426	013023	32	32													13				17	0030
227	2255	T	2	M	2253	T	2	0426	030637	28	19													13				17	0000
227	2257	T	2	M	2255	T	2	0426	063012	32	32													13				17	0000
227	2271	T	2	M	2269	T	2	0427	052122	28	26																	17	1010
271	2273	T	2	P	2271	T	2	0427	084000	32	32																16	17	0000
227	2284	T	2	M	2282	T	2	0428	025229	32	32																	17	0030
227	2286	T	2	M	2284	T	2	0428	060233	32	32																	17	0330
271	2287	T	2	P	2286	T	2	0428	092108	32	32																	17	0331
227	2298	T	2	M	2297	T	2	0429	032730	32	32													13					0030
227	2299	T	2	M	2298	T	2	0429	050706	32	32													13					0000
227	2312	T	2	M	2310	T	2	0430	003400	31	31	1		3															0020
227	2314	T	2	M	2312	T	2	0430	040000	32	32	1		3															0000
228	2324	T	2	M	2314	T	2	0430	072100	32	32	1		3															0000
228	2325	T	2	M	2324	T	2	0430	232400	30	30	1		3															0020
271	2445	T	2	P	2443	T	2	0509	022967	31	31								8					13					0020
271	2446	T	2	P	2445	T	2	0509	060218	32	30								8										0010
271	2456	D	1	P	2456	D	1	0509	223150	31	29			3															3000
271	2463	T	2	P	2457	T	2	0510	001515	07	02			3															0000
272	2471	D	2	P	2471	D	2	0510	230551	04	08			3															0000
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272	2488	T	2	P	2486	T	2	0512	015154	28	28								8					13					0000
272	2489	T	2	P	2488	T	2	0512	042442	31	31								8										0000
272	2501	T	2	P	2499	T	2	0512	221000	29	32									9				13					0000
272	2503	T	2	P	2501	T	2	0513	014138	30	32		2						8										0000
272	2504	T	2	P	2503	T	2	0513	045130	31	32								8										0000
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272	2515	D	1	P	2515	D	1	0513	230951	22	26			3															1000
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272	2529	T	2	P	2528	T	2	0514	202240	11	21			3															0000
272	2530	T	2	P	2529	T	2	0514	220320	30	21			3															0000
272	2533	T	2	P	2532	T	2	0515	042309	00	00																		0000
272	2543	D	1	P	2543	D	1	0515	205749	16	16			3															0000
272	2544	D	1	P	2544	D	1	0515	224148	17	17			3															2000
273	2546	T	2	P	2545	T	2	0516	012458	24	23													13					0000
273	2557	D	1	P	2557	D	1	0516	194940	26	26			3															3000
273	2558	D	1	P	2558	D	1	0516	213350	25	25			3															0000
273	2561	T	2	P	2559	T	2	0517	002106	24	23								8					13					0000
273	2572	D	1	P	2572	D	1	0517	202300	13	13			3						9									0000
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273	2586	D	1	P	2586	D	1	0518	191650	14	14			3															0000
273	2601	D	1	P	2601	D	1	0519	195639	11	16			3															1000
273	2615	D	1	P	2615	D	1	0520	184639	20	20			3															3000
273	2616	D	1	P	2616	D	1	0520	202839	15	22			3															1000

REEL	FILM LEGEND				PICTURE SEQUENCE DATA																											
											FRAME		GEOGRAPHICAL AREA COVERED																			LVBS
	PASS	M	C	S	PASS	M	C	DATE	TIME		US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
273	2617	D	1	P	2617	D	1	0520	221251		14	14			3																	2000
273	2629	D	1	P	2629	D	1	0521	173838		23	23			3																	3000
273	2630	D	1	P	2630	D	1	0521	192101		17	21			3																	3000
273	2632	D	1	P	2632	D	1	0521	225001		22	24			3																	2000
273	2633	D	1	P	2633	D	1	0522	003050		09	15			3																	0000
273	2644	D	1	P	2644	D	1	0522	181349		22	36			3																	3000
273	2645	D	1	P	2645	D	1	0522	195839		21	23			3																	0000
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273	2658	D	1	P	2658	D	1	0523	170650		02	02			3																	3000
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274	2661	D	1	P	2661	D	1	0523	221540		10	33			3																	0000
274	2662	T	1	P	2662	T	1	0523	235904		01	01			3																	0000
274	2673	D	1	P	2673	D	1	0524	174240		01	01			3																	0000
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274	2676	T	1	P	2676	T	1	0524	224533		13	13		2	3																	0000
274	2688	T	1	P	2687	T	1	0525	164120		26	26				4																1000
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274	2702	T	1	P	2688	T	1	0526	182400		17	17				4																0000
274	2703	T	1	P	2702	T	1	0526	171453		28	28			3	4																0000
274	2706	T	2	P	2705	T	2	0526	222040		03	03			3																	0000
274	2716	T	1	P	2703	T	1	0526	190230		21	21				4																0000
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274	2720	D	1	P	2720	D	1	0527	205630		21	21			3																	0000
274	2731	T	1	P	2730	T	1	0528	145902		22	22				4																1000
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274	2734	D	1	P	2734	D	1	0528	215218		15	15			3	4																0000
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275	2792	T	1	P	2791	T	1	0601	185050		14	13		2																		0000
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275	2864	T	1	P	2863	T	1	0606	165215		28	28			3	4																0000
275	2875	T	2	P	2862	T	2	0606	151837		32	32				4	5															0000
275	2876	T	2	P	2875	T	2	0607	123203		31	31					5	6														0000
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275	2879	T	2	P	2878	T	2	0607	173544		30	30				4						10										0000
275	2890	T	2	P	2889	T	2	0608	113114		25	25						6					11									0000
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275	2905	T	2	P	2904	T	2	0609	120215		28	28						6					11									0000
275	2908	T	2	P	2907	T	2	0609	170032		21	21				4						10										0000
275	2921	T	2	P	2919	T	2	0610	124500		24	24					5						11									0000
275	2922	T	2	P	2921	T	2	0610	160232		13	13										10						16				0000
275	2938	D	1	P	2938	D	1	0611	194850		13	08			3						9											0000
276	2948	T	2	P	2947	T	2	0612	103744		24	24											11									0000
276	2951	T	2	P	2950	T	2	0612	152527		24	20				4						10										0000
276	2961	T	2	P	2951	T	2	0612	171030		25	32										10										0000
276	3009	T	2	P	3007	T	2	0616	125500		30	32																				0000
228	3251	T	1	W	3249	T	1	0703			27	27																				0000
228	3252	T	1	W	3251	T	1	0703			29	00																				0000
228	3253	T	1	W	3252	T	1	0703			18	00																				0000
228	3264	T	1	W	326	T	1	0	0		20	00																				0000
228	3266	T	1	W	3264	T	1	0704			22	25																				0000
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228	3278	T	1	W	3267	T	1	0704			15	20																				0000
228	3278	T	2	W	3267	T	2	0704			00	00																				0000
228	3279	T	1	W	3278	T	1	0705			28	28																				0000
228	3281	T	1	W	3279	T	1	0705			21	24																				0000
228	3282	T	1	W	3281	T	1	0705			14	25																				0000
228	3292	D	1	W	3292	D	1	0705	223938		24	24				4						10										2200
228	3292	T	1	W	3292	T	1	0705			00	00																				0000
228	3296	T	1	W	3295	T	1	0706	044124		18	18								8					13							2001
228	3321	D	1	W	3321	D	1	0707	220350		08	20				4						10										1001
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229	3350	D	1	W	3350	D	1	0709	213440		05	05				4																1000
229	3351	D	1	W	3351	D	1	0709	231338		07	07				4																1000
229	3354	T	2	W	3354	T	2	0710	040000		27	27		2						8												0000
229	3379	D	1	W	3379	D	1	0711	205850		26	28				4						10										2000
229	3380	D	1	W	3380	D	1	0711	224249		17	18				4																2000
229	3381	D	1	W	3381	D	1	0712	002648		10	15			3	4																2000
229	3509	D	1	W	3509	D	1	0720	174348		14	14			3	4																000
276	3582	T	2	P		T	2				30	19																				0000
276	3582	D	2	P	3582	D	2	0725	170917		00	00			3																	0000
276	3583	D	2	P	3583	D	2	0725			00	00																				0000

REEL	FILM LEGEND				PICTURE SEQUENCE DATA					FRAME		GEOGRAPHICAL AREA COVERED																LVBS
	PASS	M	C	S	PASS	M	C	DATE	TIME	US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
275	3583	T	2	P	3582	T	2	0725	171117	20	14				4														1000
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276	3597	D	2	P	3597	D	2	0726	174300	03	00																		0000
276	3597	T	2	P	3583	T	2	0725	185607	13	13																		1000
276	3598	T	2	P	3597	T	2	0726	174430	29	19																		3000
229	3618	T	2	W	3598	T	2	0726	192900	17	17																		0000
229	3626	D	2	W	3625	D	2	0728	172307	03	03				4														1000
229	3627	T	2	W	3626	T	2	0728	172507	22	22				4	5													1000
229	3627	D	2	W	3627	D	2	0728	190826	02	02				4														1000
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229	3653	T	2	W	3640	T	2	0730	180900	06	06						6												1020
276	3672	T	2	P	3671	T	2	0731	190350	00	29				4						10								0000
276	3674	T	2	P	3672	T	2	0731		32	32										10								1000
229	3686	T	2	W	3676	T	2	0731	032400	09	09		2	3						9									0000
276	3689	T	2	P	3686	T	2	0801		18	21				4	5					10								0000
229	3701	T	2	W	3691	T	2	0801	035700	16	16		2	3						9									0220
229	3701	D	2	W	3701	D	2	0802	202044	02	02				4														0000
276	3703	T	2	P	3701	T	2	0802	202114	24	24				4						10								0000
229	3711	T	2	W	3706	T	2	0803	042500	28	28	1																	0000
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276	3775	T	2	P	3773	T	2	0807	180800	32	32				4	5					10								1000
230	3898	T	2	W	3777	T	2	0808	004100	22	22		2							9									0000
230	3932	T	2	W	3900	T	2	0816	100730	32	25											11	12					17	3000
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230	4523	D	1	W	4523	D	1	0927	211849	00	00																		0000
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